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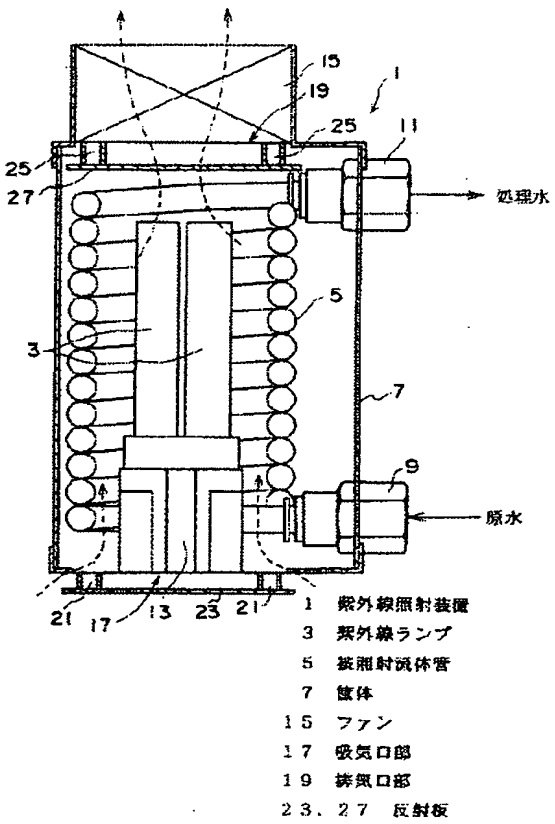

ABSTRACT : PROBLEM TO BE SOLVED: To provide an ultraviolet irradiatior wherein the apparatus is reduced in size while the utilization efficiency of ultraviolet rays emitted from an ultraviolet lamp is improved.

SOLUTION: The ultraviolet irradiator is provided with an ultraviolet lamp 3 and a passage 5 spaced from the lamp 3, used for the object to be irradiated, and made from an ultraviolet-transmitting material cylindrically surrounding the lamp 3. The passage 5 is made of a helically wound pipe to constitute the irradiator. Part of the ultraviolet rays emitted from the lamp 3 are directly absorbed by the fluid inside the helically wound tube, and the rest are repeatedly reflected between the turns of the helically wound pipe or between the tube and the lamp 3. During the repeated reflection, the rays are gradually absorbed by the fluid inside the tube. Therefore, ultraviolet rays which are not absorbed by the fluid and become useless can be reduced. Further, the apparatus can be reduced in size because the lamp 3 is situated inside the cylindrical passage 5 formed from the helically wound tube.

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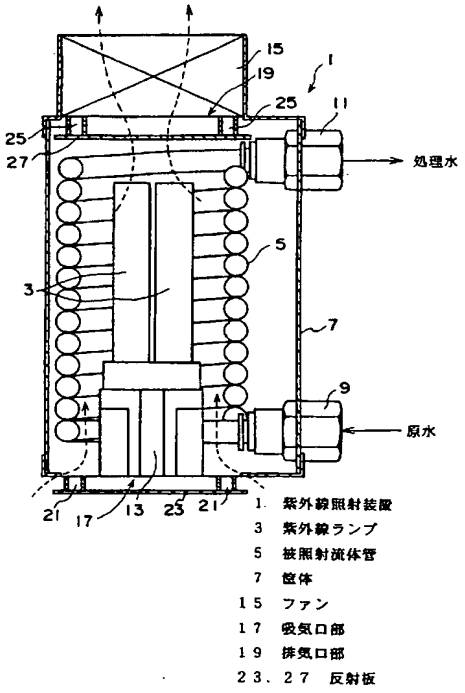
(54)【発明の名称】紫外線照射装置

(57)【要約】
【課題】紫外線ランプから放射された紫外線の利用効率を向上しながら装置を小型化できる紫外線照射装置を提供する。
【解決手段】紫外線ランプ3と、この紫外線ランプ3との間に空間を有してこの紫外線ランプ3を筒状に取り囲む紫外線透過性の材料で形成された被照射流体の流路5とを備え、この被照射流体の流路5が、螺旋状に巻かれた管で形成されている構成とする。これにより、紫外線ランプから放射された紫外線は、一部が螺旋状に巻かれた管内の被照射流体に直接吸収され、残りは螺旋状に巻かれた管同士の間またはこの管と紫外線ランプとの間で反射を繰り返す。そして、このような反射を繰り返すうちに紫外線は、螺旋状に巻かれた管内の被照射流体に吸収されて行く。このため、被照射流体に照射されずに無駄になる紫外線を低減でき、紫外線ランプから放射された紫外線の利用効率を向上できる。さらに、螺旋状に巻かれた管で形成された筒状の被照射流体の流路内に紫外線ランプが位置しているため、装置を小型化できる。
【選択図】　図1



式の紫外線照射装置では、直管状の被照射流体の流路を囲んで被照射流体の流路と同方向に延在する複数の紫外線ランプを、被照射流体の流路にできるだけ均等に紫外線を照射できるよう被照射流体の流路周囲に設ける必要がある。加えて、必要とされる紫外線照射量によって被照射流体の流路の長さや径などが決まってしまう。したがって、外照式の紫外線照射装置では、装置を小型化するのが難しいという問題がある。

【０００５】

本発明の課題は、紫外線ランプから放射された紫外線の利用効率を向上しながら装置を小型化することにある。

【０００６】

【課題を解決するための手段】

本発明の紫外線照射装置は、紫外線ランプと、この紫外線ランプとの間に空間を有してこの紫外線ランプを筒状に取り囲む紫外線透過性の材料で形成された被照射流体の流路とを備え、この被照射流体の流路が、螺旋状に巻かれた管で形成されている構成とすることにより上記課題を解決する。

【０００７】

このような構成とすれば、螺旋状に巻かれた管で形成された被照射流体の流路が紫外線ランプを筒状に取り囲んでいるため、紫外線ランプから放射された紫外線は、一部が螺旋状に巻かれた管内の被照射流体に直接吸収され、残りは螺旋状に巻かれた管同士の間またはこの管と紫外線ランプとの間で反射を繰り返す。そして、このような反射を繰り返すうちに紫外線は、螺旋状に巻かれた管内の被照射流体に吸収されて行く。このように、紫外線ランプから放射された紫外線は、一部が螺旋状に巻かれた管内の被照射流体に直接吸収され、残りが螺旋状に巻かれた管での反射を繰り返しながら螺旋状に巻かれた管内の被照射流体に吸収されてしまう。このため、被照射流体に照射されずに無駄になる紫外線を低減でき、紫外線ランプから放射された紫外線の利用効率を向上できる。さらに、紫外線の利用効率を向上できることにより紫外線照効率が向上して装置を小型化できる。加えて、螺旋状に巻かれた管で形成された筒状の被照射流体の流路内に紫外線ランプが位置しているため、より少ない本数の紫外線ランプで被照射流体の流路に均等に紫外線を照射でき、また、被照射流体の流路が螺旋状に巻いた管となっていることにより、必要な紫外線照射量を得るために必要な被照射流体の流路の大きさが、直管状の被照射流体の流路に比べて小さくなる。したがって、紫外線ランプから放射された紫外線の利用効率を向上しながら装置を小型化できる。

【０００８】

また、紫外線透過性の材料が、ポリテトラフルオロエチレンである構成とすれば、紫外線の反射率を他の紫外線透過性の材料に比べて高くでき、螺旋状に巻かれた管で形成された筒状の被照射流体の流路の外側に通り抜けて無駄になる紫外線を低減し、紫外線ランプから放射された紫外線の利用効率をより向上できるので好ましい。

【０００９】

さらに、被照射流体の流路を取り囲む　体を備え、この　体は、内側の面が紫外線を反射する反射面となっている構成とすれば、螺旋状に巻かれた管で形成された被照射流体の流路の外側に通り抜けてきた紫外線を螺旋状に巻かれた管で形成された被照射流体の流路に向けて反射させることにより、紫外線ランプから放射された紫外線の利用効率をより向上できるので好ましい。

【００１０】

また、　体は、この　体に設けられた吸気口部からこの　体内に気体を流入させ、この　体に設けられた排気口部から該　体外に気体を流出させて、この　体内に気体を通流させる通気手段を有する構成とする。このような構成とすれば、　体を設けた場合、　体内を冷却し、紫外線ランプからの発熱による　体内の温度上昇を抑えることができるので好ましい。

【００１１】

さらに、　体に設けられた吸気口部と排気口部とに、各々、紫外線ランプから放射された

反射板２３は、　体７の底の外側から　体７に取り付けられており、支持部材２１の厚みによって　体７との間に隙間が形成されている。同様に、　体７の排気口部１９に対応する位置には、排気口部１９に対応する大きさで、支持部材２５を介して　体７に固定された紫外線を反射する反射板２７が設けられている。反射板２７は、反射板２３と異なり、　体７の上面の内側から　体７に取り付けられており、支持部材２５の厚みによって　体７との間に隙間が形成されている。

【００１７】

このような構成の紫外線照射装置の動作と本発明の特徴部について説明する。なお、ここでは、被照射流体が水であり、この水に紫外線を照射することで、この水に含まれている微生物の殺滅などを行う場合を一例として説明する。また、図１及び図２では、実線の矢印が水の流れの方向を、破線の矢印が空気の流れの方向を示しており、図３及び図４では、実線の矢印が紫外線ランプ３から放射された紫外線を、破線の矢印が被照射流体管５の間、または、被照射流体管５と紫外線ランプ３との間で反射している紫外線を示している。

【００１８】

紫外線照射装置１の紫外線ランプ３が点灯している状態で、紫外線照射前の水つまり原水は、紫外線照射装置１の流入口側連結部９に連結された図示していない原水を供給する管路から被照射流体管５内に流入する。被照射流体管５内に流入した原水は、螺旋状に巻かれた被照射流体管５内を流出口側連結部１１に向けて通流する間、紫外線ランプ３から紫外線の照射を受ける。このとき、紫外線ランプ３の周囲を覆う被照射流体管５に照射された紫外線の一部は、被照射流体管５内を通流する原水に直接照射されて吸収される。一方、残りの紫外線は、図３及び図４に示すように、被照射流体管５で反射する。被照射流体管５で反射した紫外線は、被照射流体管５に照射されるか、または、一旦、紫外線ランプ３に反射して被照射流体管５に照射される。被照射流体管５または紫外線ランプ３で反射して被照射流体管５に照射された紫外線は、再び一部が被照射流体管５内を通流する原水に吸収され、残りは被照射流体管５で反射する。

【００１９】

すなわち、紫外線ランプ３から放射された紫外線は、一部が被照射流体管５に直接吸収され、残りが被照射流体管５間、または被照射流体管５と紫外線ランプ３との間で相互反射を繰り返しながら被照射流体管５内を通流する原水に照射されて吸収される。このため、被照射流体管５内を通流する原水への紫外線の入射エネルギーは、被照射流体管５内を通流する原水に直接吸収された紫外線の入射エネルギーと、被照射流体管５間、または被照射流体管５と紫外線ランプ３との間で相互反射を繰り返しながら被照射流体管５内を通流する原水に吸収された紫外線の入射エネルギーとを加算したものとなる。

【００２０】

また、被照射流体管５を透過して、被照射流体管５からなる筒の外側に通り抜けた紫外線は、　体７の内面である反射面で反射され、被照射流体管５に照射され、一部が被照射流体管５内を通流する原水に吸収され、被照射流体管５と　体７の反射面との間で相互反射を繰り返しながら、被照射流体管５内を通流する原水に吸収されて行く。さらに、紫外線ランプ３から放射されて被照射流体管５からなる筒の下端部と上端部へ向かう紫外線は、各々、反射板２３、２７で反射され、被照射流体管５からなる筒内に戻され、被照射流体管５と反射板２３、２７との間、被照射流体管５間などで相互反射を繰り返しながら、被照射流体管５内を通流する原水に吸収されて行く。

【００２１】

このように、原水は、図１に示すように、螺旋状に巻かれた被照射流体管５内を下方から上方に向けて通流する間に、十分な時間の間、紫外線ランプ３から放射された紫外線の照射を受けることで処理される。そして、紫外線の照射処理をされた水つまり処理水は、紫外線照射装置１の流出口側連結部１１に連結された図示していない処理水を導出する管路から被照射流体管５外に流出する。なお、紫外線照射装置１の紫外線ランプ３が点灯している間、つまり紫外線照射装置１が作動している間、ファン１５が駆動されている。この

に、紫外線ランプ３から放射された紫外線は、一部が被照射流体管５内の被照射流体に直接吸収され、さらに、残りが相互反射を繰り返しながら被照射流体管５内の被照射流体に吸収されてしまう。

【００２５】

つまり、被照射流体管５内の被照射流体への紫外線の入射エネルギーは、被照射流体管５内の被照射流体に直接吸収された紫外線の入射エネルギーと、相互反射を繰り返しながら被照射流体管５内の被照射流体に吸収された紫外線の入射エネルギーとを加算したものとなる。このため、紫外線ランプから放射された紫外線の利用効率を向上できる。さらに、紫外線の利用効率を向上できることにより紫外線照効率が向上して装置を小型化できる。加えて、螺旋状に巻かれた被照射流体管５からなる筒内に紫外線ランプが位置しているため、より少ない本数の紫外線ランプで被照射流体管５に均等に紫外線を照射でき、また、被照射流体管５が螺旋状に巻いた管となっていることにより、必要な紫外線照射量を得るために必要な被照射流体管５の大きさが、従来の直管状の被照射流体の流路に比べて小さくなる。したがって、紫外線ランプから放射された紫外線の利用効率を向上しながら装置を小型化できる。

【００２６】

さらに、被照射流体管５が、ポリテトラフルオロエチレン製であるため、螺旋状に巻いた被照射流体管５からなる筒の外側に通り抜けて無駄になる紫外線を低減でき、紫外線ランプから放射された紫外線の利用効率をより向上できる。加えて、　体７の内面が紫外線を反射する反射面となっているため、螺旋状に巻いた被照射流体管５からなる筒の外側に通り抜けてきた紫外線を被照射流体管５に向けて反射させることができ、紫外線ランプから放射された紫外線の利用効率をさらに向上できる。

【００２７】

ところで、紫外線照射装置では、紫外線ランプの点灯と消灯を繰り返すと紫外線ランプの寿命が低下し、紫外線ランプの交換頻度が高くなってしまうため、紫外線ランプは、常時点灯状態にしている場合がある。このとき、内照式の紫外線照射装置では、例えば被照射流体の流量が比較的遅い場合や、被照射流体の通流が停止された場合、被照射流体への紫外線照射を行う必要がなくても紫外線ランプが点灯した状態となることにより、被照射流体の流路内の被照射流体が紫外線ランプの発熱によって加熱され、被照射流体の温度が上昇してしまう。被照射流体の温度が上昇すると、被照射流体や被照射流体に含まれる物質などが変性するといった不都合が生じたり、また、被照射流体に蓄積された熱により紫外線ランプが過熱状態となり、かえって紫外線ランプの寿命を短くしてしまうなどの不都合が生じる場合がある。

【００２８】

これに対して、本実施形態の紫外線照射装置１では、被照射流体の流路である被照射流体管５と、螺旋状に巻かれた被照射流体管５からなる筒内に設置された紫外線ランプ３との間には空間が設けられているため、紫外線ランプ３を常時点灯していても、被照射流体管５内の被照射流体は加熱され難く、被照射流体の温度上昇を抑制することができる。

【００２９】

さらに、　体７は、吸気口部１７、排気口部１９、そしてファン１５などからなる通気手段を有しているため、　体７に外気を通流させて　体７内を冷却し、紫外線ランプ３からの発熱による　体７内の温度上昇を抑えることにより、より確実に被照射流体管５内の被照射流体の温度上昇を抑制できる。加えて、　体７に設けられた吸気口部１７と排気口部１９とに、各々、紫外線ランプ３から放射された紫外線を　体７内に反射する反射板２３、２７が設けられているため、吸気口部１７や排気口部１９から　体７外部に出て無駄になる紫外線低減でき、紫外線の利用効率を一層向上できる。

【００３０】

また、本実施形態では、被照射流体管５をポリテトラフルオロエチレンにより形成しているが、石英ガラスなど他の紫外線透過性の材料で形成することもできる。但し、螺旋状に巻いた被照射流体管５からなる筒の外側に通り抜けて無駄になる紫外線を低減できるので

線照射装置１を用いることによって設置スペースを低減したディスペンサーを提供できる。

【００３８】

本発明を適用してなる紫外線照射装置を利用した別のカップ式飲料水販売機つまりディスペンサーは、図６に示すように、水道管などに直接連結された給水流路３９に、水の流れの方向に対して上流側から活性炭吸着筒４１、本実施形態の紫外線照射装置１、注ぎ口３４に連結された給水弁４３などで構成されている。本ディスペンサーでは、給水弁４３を開けることによって、給水流路３９に水が通流し、活性炭吸着筒４１及び紫外線照射装置１で浄化処理された飲料水が注ぎ口３４から供給されるものである。

【００３９】

このような本ディスペンサーでは、給水弁４３が閉じられ、飲料水を供給しない状態のときには、水が給水流路３９内、活性炭吸着筒４１、そして紫外線照射装置１内に滞留する。したがって、常時紫外線ランプが点灯している紫外線照射装置に水が滞留することによって水の温度が上昇してしまう。紫外線照射装置ないでの水の温度の上昇は、紫外線ランプの寿命を短くするといった不具合の原因となる。しかし、本ディスペンサーでは、本実施形態の紫外線照射装置１を備えているため、水が紫外線照射装置１内に滞留しているときに、水の温度は上昇し難くい。

【００４０】

本発明を適用してなる紫外線照射装置を利用した浄化槽４５は、図７に示すように、内部が仕切板４６、４７により、水の流れに対して上流側から　雑物除去槽４９、流量調整槽５１、そして曝気槽５３に仕切られている。被処理水は、流入口部５５から　雑物除去槽４９に流入し、　雑物除去槽４９を構成する流路内を上方から底部に向けて、また底部から上方に流れ、流路内に設置された　材５７により、　雑物が除去される。　雑物除去槽４９を通過した被処理水は、越流堰となる仕切板４６の上端部を越流して流量調整槽５１に流れ込む。流量調整槽５１に流れ込んだ被処理水は、エアリフト５９を介して流量調整槽５１から曝気槽５３に流れ込む。エアリフト５９は、仕切板４７に沿って上下方向に延在させて設置された部分を有する管路５９ａ、管路５９ａ内に管路５９ａと同軸に挿通されて送風機からの空気が通流する送気管路５９ｂなどで構成されている。

【００４１】

曝気槽５３内には、浸漬型平膜ユニット６１が、膜面を鉛直方向に立てた状態で設置されており、浸漬型平膜ユニット６１の平膜下方には、空気を供給する送気管路６３が連結され、吹き出し口を上方、つまり浸漬型平膜ユニット６１の平膜に向けたエアディフューザー６５が設けられている。曝気槽５３内の被処理水は、越流堰となる仕切板４７の上端部を越流して流量調整槽５１に流れ込む。また、曝気槽５３の上部の流出口部６７が設けられた部分には、曝気槽５３と仕切られた空間が形成されており、この曝気槽５３と仕切られた空間に本実施形態の紫外線照射装置１が設置されている。紫外線照射装置１の下方には、吸引管路６９を介して曝気槽５３内の被処理水を吸引して、紫外線照射装置１に送る吸引ポンプ７１が設けられている。吸引ポンプ７１で吸引された曝気槽５３内の被処理水は、被処理水供給管路７３を介して紫外線照射装置１の流入口側連結部９から被照射流体管５に流入し、紫外線の照射により殺菌処理される。殺菌処理された被処理水は、紫外線照射装置１の流出口側連結部１１から、紫外線照射装置１の流出口側連結部１１と流出口部６７とを連結する被処理水流出管路７５に流入し、流出口部６７から浄化槽４５外に流出する。

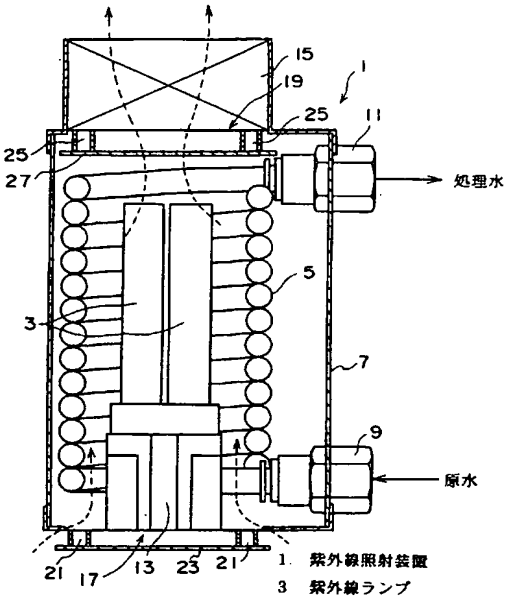
【００４２】

このような本浄化槽４５では、浄化槽４５から流出する被処理水の温度が上昇し難い。さらに、紫外線照射装置１は小型化が可能であるため、浄化槽４５自体の大きさも小型化でき、紫外線照射装置１を用いることによって設置スペースを低減した一戸建て用などの比較的小型の浄化槽を提供できる。

【００４３】

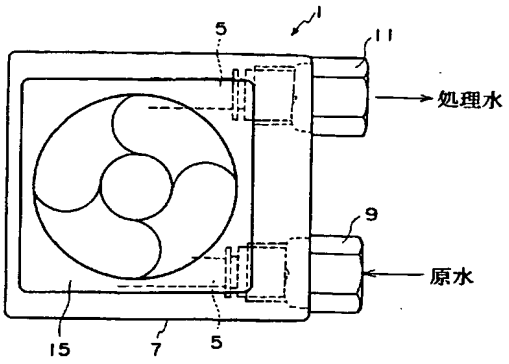
【発明の効果】

【図１】

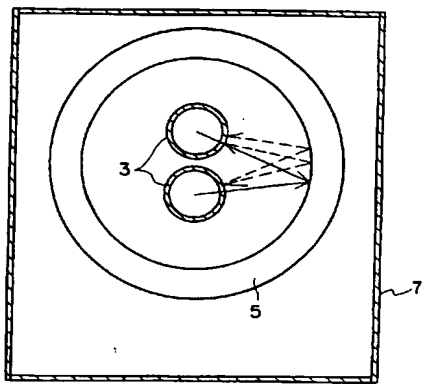


1　紫外線照射装置
3　紫外線ランプ
5　被照射流体管
7　筐体
15　ファン
17　吸気口部
19　排気口部
23、27　反射板

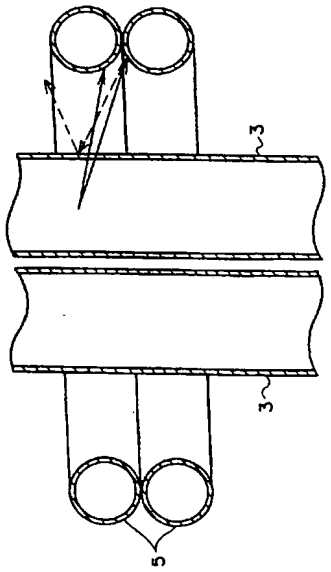
【図２】



【図３】



【図４】



フロントページの続き

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Ｆターム(参考) 4D037 AA02 AB03 BA18 CA01
4G075 AA15 AA70 BD16 CA33 CA54 DA02 EB25 EB33 FB02 FB06
FB12

JP-A-2004-066045

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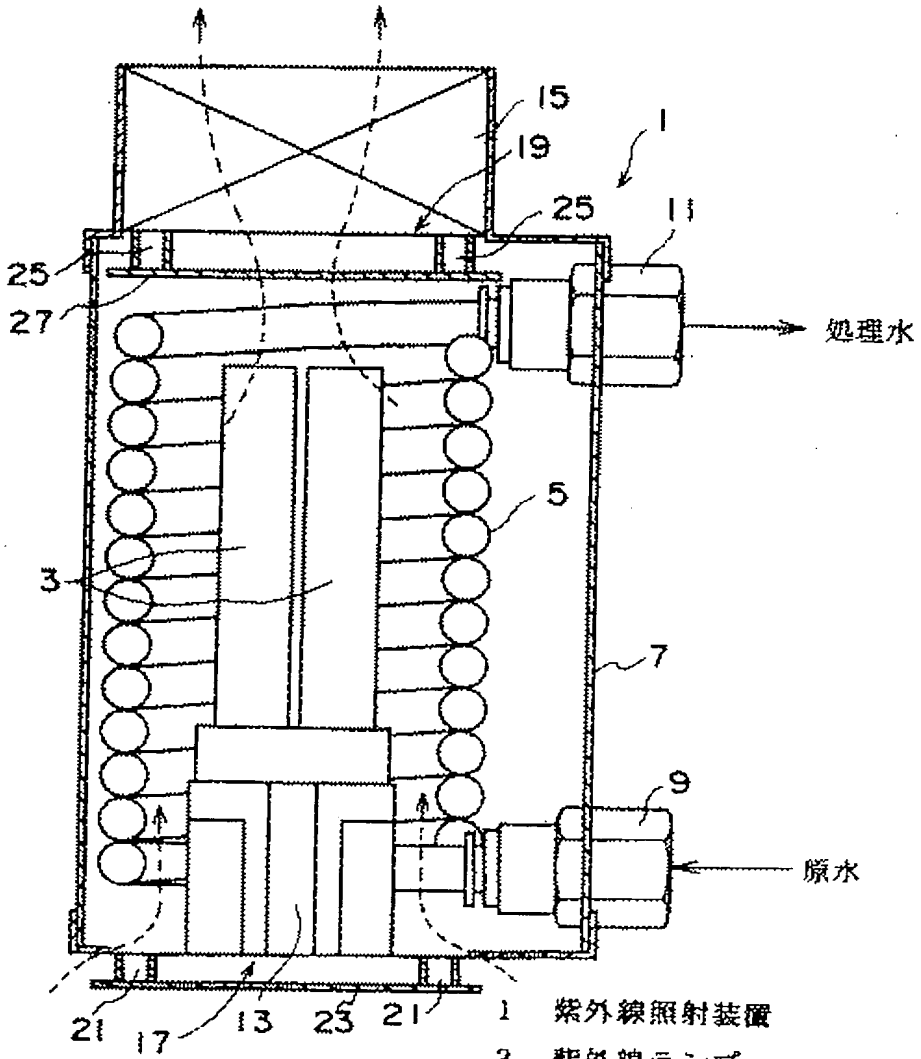
** SS 1: Results 1

Search statement 2

prt fu img

1/1 WPAT - (C) Thomson Derwent- image
CPIM Thomson Derwent
AN - 2004-350652 [33]
XA - C2004-133562
XP - N2004-280631
TI - Ultraviolet ray irradiation device for drinking water vending machine, has flow path into which fluid containing diactinism material flows, that is spirally wound on cylindrical ultraviolet ray lamps
DC - A97 D15 J04 S05 T05 X25
PA - (CHIY-) CHIYODA KOHAN KK
NP - 1
NC - 1
PN - JP2004066045 A 20040304 DW2004-33 C02F-001/32 13p *
AP: 2002JP-0225915 20020802
PR - 2002JP-0225915 20020802
IC - C02F-001/32 B01J-019/12 G21K-005/00 G21K-005/10
AB - JP2004066045 A
NOVELTY - A flow path (5) into which fluid containing diactinism material e.g. polytetrafluoroethylene flows, is spirally wound on a pair of cylindrical ultraviolet (UV) ray lamps (3). The fluid is irradiated with UV rays emitted from the UV ray lamps.
- USE - For drinking water sterilization in drinking water vending machine and for oral-cavity wash-water sterilization in dentists and home, using ultraviolet radiation.
- ADVANTAGE - Improves utilization efficiency of the UV radiation emitted from the UV ray lamps effectively, without increasing the size and cost of the UV ray irradiation device.
- DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of the UV ray irradiation device. (Drawing includes non-English language text).
- UV ray lamps 3
- Fluid flow path 5
- Case 7
- Fan 15
- Air intake 17
- Reflecting plates 13,27(Dwg.1/7)
MC - CPI: A12-W11J D04-A01P J04-X
- EPI: S05-G01B T05-H06 X25-F03B1 X25-H03
UP - 2004-33
UP4 - 2004-05



1　紫外線照射装置
3　紫外線ランプ
5　被照射流体管
7　筐体
15　ファン
17　吸気口部
19　排気口部
23、27　反射板

MACHINE TRANSLATION PF JP-A-2004-066045

CLAIMS

[Claim(s)]
[Claim 1]
The black light in which is equipped with the passage of the irradiated fluid formed between the ultraviolet ray lamp and this ultraviolet ray lamp with the ingredient of the diactinism which has space and encloses this ultraviolet ray lamp in tubed, and the passage of this irradiated fluid is formed with tubing rolled spirally.
[Claim 2]
The black light according to claim 1 with which the ingredient of said diactinism is characterized by being polytetrafluoroethylene.
[Claim 3]
It is the black light according to claim 1 or 2 which is equipped with the case which encloses the passage of said irradiated fluid, and is characterized by this case serving as a reflector in which an inside field reflects ultraviolet rays.
[Claim 4]
Said case is a black light according to claim 3 characterized by having an aeration means to make a gas flow in this case from the inlet section prepared in this case, to make a gas flow out of the exhaust-port section prepared in this case out of this case, and to carry out conduction of the gas into this case.
[Claim 5]
The black light according to claim 4 respectively characterized by forming the reflecting plate which reflects the ultraviolet rays emitted from said ultraviolet ray lamp in said case at the inlet section prepared in said case, and the exhaust-port section.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]
This invention relates to a black light and relates to the black light for irradiating ultraviolet rays especially at a fluid.
[0002]
[Description of the Prior Art]
The black light for irradiating ultraviolet rays at a fluid is divided roughly into the black light of a ** type, and the black light of an outside ** type which is indicated by

JP,10-309569,A etc. inside, as indicated by JP,7-204639,A etc. The ultraviolet ray lamp which the irradiated fluid which can irradiate ultraviolet rays inserted in tubing of diactinism into conduction, the held passage, or a tub is installed, and the black light of an inside ** type irradiates ultraviolet rays from the passage of an irradiated fluid, or the inside of a tub at an irradiated fluid. On the other hand, the black light of an outside ** type surrounds the passage of the irradiated fluid of the shape of a straight pipe formed with the ingredient of diactinism, and two or more ultraviolet ray lamps which extend along the extension direction of the passage of this irradiated fluid set spacing, and are installed. That is, the black light of an outside ** type irradiates ultraviolet rays at an irradiated fluid from the outside of the passage of the irradiated fluid in which an irradiated fluid carries out conduction.

[0003]

[Problem(s) to be Solved by the Invention]

By the way, in the black light of an inside ** type, since the ultraviolet rays which reached the inside of the wall which is emitted from an ultraviolet ray lamp, penetrates an irradiated fluid, and forms the passage of an irradiated fluid will be absorbed by the inside of the wall and become useless, a problem is in the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp.

[0004]

On the other hand, in the black light of an outside ** type, all the ultraviolet rays emitted from two or more ultraviolet ray lamps are not irradiated by the irradiated fluid. For this reason, although the ultraviolet rays which are not irradiated by such irradiated fluid are reflected, the reflecting plate is provided so that two or more ultraviolet ray lamps may be surrounded. Thus, he is trying for the ultraviolet rays emitted from two or more ultraviolet ray lamps to be irradiated as much as possible by the irradiated fluid by forming a reflecting plate in the black light of an outside ** type. However, there are ultraviolet rays which are absorbed by the reflecting plate etc. and become useless with the black light of an outside ** type as well as the black light of an inside ** type, and a problem is in the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp. Furthermore, in the black light of an outside ** type, it is necessary to form two or more ultraviolet ray lamps which surround the passage of an irradiated straight pipe-like fluid and extend in the passage and this direction of an irradiated fluid in the perimeter of passage of an irradiated fluid so that ultraviolet rays can be irradiated in the passage of an irradiated fluid as equally as possible. In addition, die length, a path, etc. of passage of an irradiated fluid will be decided by the amount of UV irradiation needed. Therefore, in the black light of an outside ** type, there is a problem that it is difficult to miniaturize equipment.

[0005]

The technical problem of this invention is to miniaturize equipment, improving the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp.

[0006]

[Means for Solving the Problem]

The black light of this invention is equipped with the passage of the irradiated fluid formed between an ultraviolet ray lamp and this ultraviolet ray lamp with the ingredient of the diactinism which has space and encloses this ultraviolet ray lamp in tubed, and when the passage of this irradiated fluid considers as the configuration currently formed with tubing rolled spirally, it solves the above-mentioned technical problem.

[0007]

Since the passage of such a configuration, then the irradiated fluid formed with tubing rolled spirally encloses the ultraviolet ray lamp in tubed, the ultraviolet rays emitted from the ultraviolet ray lamp are directly absorbed by the irradiated fluid in tubing around which the part was wound spirally, and the remainder repeats reflection among tubing rolled spirally or between this tubing and ultraviolet ray lamp. And while repeating such reflection, ultraviolet rays are absorbed by the irradiated fluid in tubing rolled spirally, and go. Thus, the ultraviolet rays emitted from the ultraviolet ray lamp are directly absorbed by the irradiated fluid in tubing around which the part was wound spirally, and while the remainder repeats reflection with tubing rolled spirally, they will be absorbed by the irradiated fluid in tubing rolled spirally. For this reason, the ultraviolet rays which become useless, without an irradiated fluid irradiating can be reduced, and the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp can be improved. Furthermore, by the ability improving the use effectiveness of ultraviolet rays, ultraviolet-rays ****** improves and equipment can be miniaturized. In addition, since the ultraviolet ray lamp is located in the passage of the tubed irradiated fluid formed with tubing rolled spirally, When ultraviolet rays can be equally irradiated with the ultraviolet ray lamp of a smaller number in the passage of an irradiated fluid and the passage of an irradiated fluid serves as tubing rolled spirally The magnitude of the passage of an irradiated fluid required in order to obtain the required amount of UV irradiation becomes small compared with the passage of an irradiated straight pipe-like fluid. Therefore, equipment can be miniaturized, improving the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp.

[0008]

Moreover, since the use effectiveness of the ultraviolet rays which reduced the ultraviolet rays to which the ingredient of diactinism can make high the configuration which is polytetrafluoroethylene, then the reflection factor of ultraviolet rays compared with the ingredient of other diactinism, passes on the outside of the passage of the tubed irradiated fluid formed with tubing rolled spirally, and becomes useless, and were emitted from the ultraviolet ray lamp can be improved more, it is desirable.

[0009]

It has the case which encloses the passage of an irradiated fluid. Furthermore, this case By reflecting the ultraviolet rays which have passed on the outside of the passage of the configuration which the inside field has to the reflector in which ultraviolet rays are reflected, then the irradiated fluid formed with tubing rolled spirally towards the passage of the irradiated fluid formed with tubing around which it was wound spirally Since the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp can be improved more, it is desirable.

[0010]

Moreover, a case makes a gas flow in this case from the inlet section prepared in this case, makes a gas flow out of the exhaust-port section prepared in this case out of this case, and is considered as the configuration which has an aeration means to carry out conduction of the gas into this case. When such a configuration, then a case are prepared, since the inside of a case can be cooled and the temperature rise in the case by generation of heat from an ultraviolet ray lamp can be suppressed, it is desirable.

[0011]

Furthermore, it considers as the configuration which formed the reflecting plate which reflects in a case the ultraviolet rays emitted from the ultraviolet ray lamp respectively at the inlet section prepared in the case, and the exhaust-port section. Since it can prevent the ultraviolet rays which have passed on the outside of the passage of such a

configuration, then the irradiated fluid formed with tubing rolled spirally coming out from the inlet section or the exhaust-port section to the case exterior, and becoming useless, it is desirable.
[0012]
[Embodiment of the Invention]
Hereafter, 1 operation gestalt of the black light which comes to apply this invention is explained with reference to drawing 1 thru/or drawing 4 . Drawing 1 is the sectional view seen from the side-face side which shows the outline configuration and actuation of a black light which come to apply this invention. Drawing 2 is the top view showing the outline configuration and actuation of a black light which come to apply this invention. Drawing 3 is the cross-sectional view of the black light explaining the condition of reflection of ultraviolet rays with irradiated fluid tubing. Drawing 4 is expanding and showing [some of ultraviolet ray lamps explaining the condition of reflection of ultraviolet rays with irradiated fluid tubing and irradiated fluid tubing] drawing of longitudinal section.
[0013]
The black light 1 of this operation gestalt covers the perimeter of an ultraviolet ray lamp 3 with the irradiated fluid tubing 5 used as the passage of an irradiated fluid rolled spirally, as shown in drawing 1 and drawing 2 , and an ultraviolet ray lamp 3 and the irradiated fluid tubing 5 are held in the case 7. An ultraviolet ray lamp 3 is a straight pipe-like bulb, and has connections, such as a mouthpiece which is not illustrated to an end side. The irradiated fluid tubing 5 is tubing made from the product made from polytetrafluoroethylene, i.e., Teflon, (trademark) which is the ingredient of diactinism, and is rolled spirally [there is no clearance as possible and], and the whole is formed in the shape of a cylinder. When it comes to the input into the irradiated fluid tubing 5 of an irradiated fluid, in the end section of the irradiated fluid tubing 5 both The input side connection section 9 used as the connection section with the duct which supplies the irradiated fluid which is not illustrated into the irradiated fluid tubing 5 to the other end of the irradiated fluid tubing 5 The tap hole side connection section 11 used as the connection section with the duct which derives the irradiated fluid which is illustrated when it comes to [neither of] the tap hole out of the irradiated fluid tubing 5 of an irradiated fluid from the inside of the irradiated fluid tubing 5 is formed.
[0014]
In the case 7, towards the lengthwise direction that is, the irradiated fluid tubing 5 turns the both ends of the cylinder which consists of irradiated fluid tubing 5 rolled spirally in the vertical direction, is installed, further, the input side connection section 9 of the irradiated fluid tubing 5 is located in the pars-basilaris-ossis-occipitalis side of a case 7, and locates the tap hole side connection section 11 of the irradiated fluid tubing 5 in the upper part side of a case 7, and is installed. Both the input side connection section 9 of the irradiated fluid tubing 5 and the tap hole side connection section 11 are in the condition of having penetrated the same side attachment wall of a case 7, and having projected on the outside of a case 7. The ultraviolet ray lamp 3 is connected with the socket section 13 installed in a part for the bottom surface part of the case 7 corresponding to the medial axis of the cylinder which consists of irradiated fluid tubing 5. Therefore, an ultraviolet ray lamp 3 is in the condition which extended in the direction in alignment with the medial axis of the cylinder which becomes the medial-axis part of the cylinder which consists of irradiated fluid tubing 5 from the irradiated fluid tubing 5, and is installed in the condition with space between the insides of the cylinder which consists of irradiated fluid tubing 5. In addition, two

ultraviolet ray lamps 3 are connected with the socket section 13 with this operation gestalt. Moreover, the socket section 13 is electrically connected to the control section which controls lighting of an ultraviolet ray lamp 3 and which is not illustrated through wiring which is not illustrated.

[0015]

ingredients with the reflective effectiveness of ultraviolet rays high as much as possible, such as an aluminum plate, come out [an internal surface], and the case 7 is covered. In addition, the internal surface of a case 7 is also processible with plating, polish, etc., if not only sticking an aluminum plate etc. if ultraviolet rays can be reflected but ultraviolet rays can be reflected. Furthermore, opening of the magnitude corresponding to the path of the cylinder by which a case 7 becomes a top face and a base from the irradiated fluid tubing 5 respectively is prepared. And the fan 15 who attracts the air in a case 7 is attached in opening by the side of the top face of a case 7 from the outside of a case 7. Therefore, opening by the side of the base of a case 7 turns into the inlet section 17 which makes air flow in a case 7, and opening by the side of the top face of a case 7 turns into the exhaust-port section 19 into which the air in a case 7 is made to flow. Thus, a fan 15, the inlet section 17, and the exhaust-port section 19 constitute an aeration means to carry out conduction of the ambient atmosphere around the cases 7, such as air, into a case 7.

[0016]

Moreover, the reflecting plate 23 which reflects the ultraviolet rays fixed to the case 7 through the supporter material 21 in the magnitude corresponding to the inlet section 17 is formed in the location corresponding to the inlet section 17 of a case 7. The reflecting plate 23 is attached in the case 7 from the outside of the bottom of a case 7, and the clearance is formed between cases 7 of the thickness of the supporter material 21. Similarly, the reflecting plate 27 which reflects the ultraviolet rays fixed to the case 7 through the supporter material 25 in the magnitude corresponding to the exhaust-port section 19 is formed in the location corresponding to the exhaust-port section 19 of a case 7. Unlike the reflecting plate 23, the reflecting plate 27 is attached in the case 7 from the inside of the top face of a case 7, and the clearance is formed between cases 7 of the thickness of the supporter material 25.

[0017]

The description section of actuation of the black light of such a configuration and this invention is explained. In addition, an irradiated fluid is water and the case where **** of the microorganism contained in this water etc. is performed by irradiating ultraviolet rays at this water is explained as an example here. Moreover, at drawing 1 and drawing 2 , the arrow head of a continuous line shows the flow direction of water, the arrow head of a broken line shows the flow direction of air, and drawing 3 and drawing 4 show the ultraviolet rays in which the arrow head of a broken line is reflecting the ultraviolet rays to which the arrow head of a continuous line was emitted from the ultraviolet ray lamp 3 between the irradiated fluid tubing 5 or between the irradiated fluid tubing 5 and an ultraviolet ray lamp 3.

[0018]

In the condition that the ultraviolet ray lamp 3 of a black light 1 is on, it flows in the irradiated fluid tubing 5 from the duct which supplies the raw water which was connected with the input side connection section 9 of a black light 1, and which is not illustrated, the water, i.e., the raw water, before UV irradiation. The raw water which flowed in the irradiated fluid tubing 5 receives the exposure of ultraviolet rays from an ultraviolet ray lamp 3, while turning and carrying out conduction of the inside of the irradiated fluid tubing 5 rolled spirally to the tap hole side connection section 11.

At this time, some ultraviolet rays irradiated by the wrap irradiated fluid tubing 5 in the perimeter of an ultraviolet ray lamp 3 are directly irradiated by the raw water which carries out conduction of the inside of the irradiated fluid tubing 5, and it is absorbed. On the other hand, the remaining ultraviolet rays are reflected with the irradiated fluid tubing 5, as shown in drawing 3 and drawing 4 . The ultraviolet rays reflected with the irradiated fluid tubing 5 are irradiated by the irradiated fluid tubing 5, or it reflects in an ultraviolet ray lamp 3, and they are once irradiated by the irradiated fluid tubing 5. The ultraviolet rays in which it reflected with the irradiated fluid tubing 5 or an ultraviolet ray lamp 3 and which were irradiated by the irradiated fluid tubing 5 are absorbed by the raw water with which a part carries out conduction of the inside of the irradiated fluid tubing 5 again, and the remainder is reflected with the irradiated fluid tubing 5.

[0019]

That is, a part is directly absorbed by the irradiated fluid tubing 5, and the ultraviolet rays emitted from the ultraviolet ray lamp 3 are irradiated and absorbed by the raw water which carries out conduction of the inside of the irradiated fluid tubing 5 while the remainder repeats an interflection between the irradiated fluid tubing 5 or between the irradiated fluid tubing 5 and an ultraviolet ray lamp 3. For this reason, the incidence energy of the ultraviolet rays to the raw water which carries out conduction of the inside of the irradiated fluid tubing 5 becomes a thing adding the incidence energy of the ultraviolet rays absorbed by the raw water which carries out conduction of the inside of the irradiated fluid tubing 5 to the incidence energy of the ultraviolet rays directly absorbed by the raw water which carries out conduction of the inside of the irradiated fluid tubing 5 while repeating an interflection between the irradiated fluid tubing 5 or between the irradiated fluid tubing 5 and an ultraviolet ray lamp 3.

[0020]

Moreover, it is reflected in the reflector which is an inside of a case 7, and the ultraviolet rays which passed on the outside of the cylinder which penetrates the irradiated fluid tubing 5 and consists of irradiated fluid tubing 5 are irradiated by irradiated fluid tubing 5, while a part is absorbed by the raw water which carries out conduction of the inside of the irradiated fluid tubing 5 and repeats an interflection between the irradiated fluid tubing 5 and the reflector of a case 7, are absorbed by the raw water which carries out conduction of the inside of the irradiated fluid tubing 5, and go. Furthermore, respectively, it is reflected with reflecting plates 23 and 27, and being returned in the cylinder which consists of irradiated fluid tubing 5, and repeating an interflection between the irradiated fluid tubing 5 and reflecting plates 23 and 27, between the irradiated fluid tubing 5, etc., the ultraviolet rays which go to the lower limit section and the upper limit section of the cylinder which is emitted from an ultraviolet ray lamp 3 and consists of irradiated fluid tubing 5 are absorbed by the raw water which carries out conduction of the inside of the irradiated fluid tubing 5, and go.

[0021]

Thus, raw water is processed between sufficient time amount by receiving the exposure of the ultraviolet rays emitted from the ultraviolet ray lamp 3, while the inside of the irradiated fluid tubing 5 rolled spirally is turned to the upper part and carries out conduction from a lower part, as shown in drawing 1 . And it flows out of the duct which derives the treated water which was connected with the tap hole side connection section 11 of a black light 1, and which is not illustrated out of the irradiated fluid tubing 5, the water, i.e., the treated water, carried out in exposure processing of ultraviolet rays. In addition, while the ultraviolet ray lamp 3 of a black

light 1 is on (i.e., while the black light 1 is operating), the fan 15 is driving. For this reason, air flows in a case 7 through the inlet section 17 of a case 7 from the clearance between a reflecting plate 23 and a case 7, and the air in a case 7 flows out of the clearance between a reflecting plate 25 and a case 7 out of a case 7 through the exhaust-port section 19 of a case 7. Thus, while the black light 1 is operating by carrying out conduction of the air to a case 7, the raw water in the irradiated fluid tubing 5 was cooled, and when the flow rate of the raw water in the irradiated fluid tubing 5 is low, or when piling up, it has prevented the temperature of raw water rising.

[0022]

Here, in order to compare the use effectiveness of the ultraviolet rays by the ingredient which forms the irradiated fluid tubing 5, the result of having performed the sterilization trial of a Bacillus-subtilis spore object is shown in Table 1. Although an ultraviolet ray lamp 3 and the irradiated fluid tubing 5 rolled spirally as well as the black light 1 of this operation gestalt were installed in the exam, the inside of a case examined with the configuration which has not been made into the reflector in which ultraviolet rays are reflected. Moreover, using the irradiated fluid tubing 5 made from the polytetrafluoroethylene of this operation gestalt, and irradiated fluid tubing made from quartz glass, the exam compared the amount of UV irradiation respectively, when the flow rate of the raw water in irradiated fluid tubing was a part for part 3l./for part 2l./for part 1.5l./for 1l./. The incidence energy of the ultraviolet rays directly absorbed by the raw water which carries out conduction of the inside of irradiated fluid tubing, so that there were many amounts of UV irradiation, The total incidence energy irradiated by the raw water adding the incidence energy of the ultraviolet rays absorbed by the raw water which carries out conduction of the inside of irradiated fluid tubing while repeating an interflection between irradiated fluid tubing or between irradiated fluid tubing and an ultraviolet ray lamp will be large, and there are few ultraviolet rays which became useless. It is shown that the use effectiveness of ultraviolet rays is high.

[0023]

[Table 1]

As shown in Table 1, when irradiated fluid tubing made from polytetrafluoroethylene was used like the irradiated fluid tubing 5 of this operation gestalt, the amount of UV irradiation increased about 1.7 to 1.8 times from the case where irradiated fluid tubing

made from quartz glass is used. This is considered to be because it to have passed besides the cylinder by which the permeability of ultraviolet rays with a wavelength of 254nm consists of irradiated fluid tubing made from quartz glass which ultraviolet rays penetrated irradiated fluid tubing made from quartz glass, and they rolled spirally since about 95% and a reflection factor were about 5% and to have been absorbed by the inside of a case with quartz glass. On the other hand, by polytetrafluoroethylene, since it has amorphous microcrystal structure, a reflection factor is high, the permeability of the ultraviolet rays which are the wavelength of 254nm becomes about 30%, and the reflection factor has become about 60%, and since there are few ultraviolet rays absorbed by the inside of a case rather than irradiated fluid tubing made from quartz glass and the effectiveness of the improvement in use effectiveness of the ultraviolet rays by the interflection is large, it thinks.

[0024]

Thus, in the black light 1 of this operation gestalt, since the irradiated fluid tubing 5 rolled spirally encloses the ultraviolet ray lamp 3 in tubed, as for the ultraviolet rays emitted from the ultraviolet ray lamp 3, a part is directly absorbed by the irradiated fluid in the irradiated fluid tubing 5, and the remainder repeats reflection among five irradiated fluid tubing or between the irradiated fluid tubing 5 and an ultraviolet ray lamp 3. And while repeating such reflection, ultraviolet rays are absorbed by the irradiated fluid in the irradiated fluid tubing 5, and go. Thus, a part is directly absorbed by the irradiated fluid in the irradiated fluid tubing 5, and further, the ultraviolet rays emitted from the ultraviolet ray lamp 3 will be absorbed by the irradiated fluid in the irradiated fluid tubing 5, while the remainder repeats an interflection.

[0025]

That is, the incidence energy of the ultraviolet rays to the irradiated fluid in the irradiated fluid tubing 5 becomes a thing adding the incidence energy of the ultraviolet rays directly absorbed by the irradiated fluid in the irradiated fluid tubing 5, and the incidence energy of the ultraviolet rays absorbed by the irradiated fluid in the irradiated fluid tubing 5 while repeating the interflection. For this reason, the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp can be improved. Furthermore, by the ability improving the use effectiveness of ultraviolet rays, ultraviolet-rays ****** improves and equipment can be miniaturized. In addition, since the ultraviolet ray lamp is located in the cylinder which consists of irradiated fluid tubing 5 rolled spirally, when it can irradiate ultraviolet rays equally with the ultraviolet ray lamp of a smaller number at the irradiated fluid tubing 5 and the irradiated fluid tubing 5 is tubing rolled spirally, the magnitude of the irradiated fluid tubing 5 required in order to obtain the required amount of UV irradiation becomes small compared with the passage of the irradiated fluid of the shape of a conventional straight pipe. Therefore, equipment can be miniaturized, improving the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp.

[0026]

Furthermore, since the irradiated fluid tubing 5 is a product made from polytetrafluoroethylene, the ultraviolet rays which pass on the outside of the cylinder which consists of irradiated fluid tubing 5 rolled spirally, and become useless can be reduced, and the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp can be improved more. In addition, since the inside of a case 7 is the reflector in which ultraviolet rays are reflected, the irradiated fluid tubing 5 can be made to turn and reflect the ultraviolet rays which have passed on the outside of the cylinder which consists of irradiated fluid tubing 5 rolled spirally, and the use

effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp can be improved further.

[0027]

By the way, in the black light, since the life of an ultraviolet ray lamp will fall and the exchange frequency of an ultraviolet ray lamp will become high if lighting and putting out lights of an ultraviolet ray lamp are repeated, the ultraviolet ray lamp may always be changed into the lighting condition. When the case where the flow rate of an irradiated fluid is comparatively late, and the conduction of an irradiated fluid are suspended with the black light of an inside ** type, for example at this time, even if it is not necessary to perform UV irradiation to an irradiated fluid, by being in the condition that the ultraviolet ray lamp lit up, the irradiated fluid in the passage of an irradiated fluid will be heated by generation of heat of an ultraviolet ray lamp, and the temperature of an irradiated fluid will rise. If the temperature of an irradiated fluid rises, un-arranging [that the matter contained in an irradiated fluid or an irradiated fluid denaturalizes] may arise, and an ultraviolet ray lamp may be in overheating with the heat accumulated in the irradiated fluid, and un-arranging [of shortening the life of an ultraviolet ray lamp on the contrary] may arise.

[0028]

On the other hand, in the black light 1 of this operation gestalt, since space is prepared between the irradiated fluid tubing 5 which is the passage of an irradiated fluid, and the ultraviolet ray lamp 3 installed in the cylinder which consists of irradiated fluid tubing 5 rolled spirally, even if it has always turned on the ultraviolet ray lamp 3, the irradiated fluid in the irradiated fluid tubing 5 is hard to be heated, and can control the temperature rise of an irradiated fluid.

[0029]

Furthermore, since the case 7 has the aeration means which consists of the inlet section 17, the exhaust-port section 19, a fan 15, etc., it can control the temperature rise of the irradiated fluid in the irradiated fluid tubing 5 more certainly by carrying out conduction of the open air to a case 7, cooling the inside of a case 7, and suppressing the temperature rise in the case 7 by generation of heat from an ultraviolet ray lamp 3. In addition, since the reflecting plates 23 and 27 which reflect the ultraviolet rays respectively emitted from the ultraviolet ray lamp 3 in a case 7 are formed in the inlet section 17 prepared in the case 7, and the exhaust-port section 19, it can come out from the inlet section 17 or the exhaust-port section 19 to the case 7 exterior, and it becomes useless, and ultraviolet-rays reduction can be carried out and the use effectiveness of ultraviolet rays can be improved further.

[0030]

Moreover, in this operation gestalt, although the irradiated fluid tubing 5 is formed by polytetrafluoroethylene, it can also form with ingredients of other diactinism, such as quartz glass. However, since the ultraviolet rays which pass on the outside of the cylinder which consists of irradiated fluid tubing 5 rolled spirally, and become useless can be reduced, it is desirable to use the irradiated fluid tubing 5 made from polytetrafluoroethylene.

[0031]

Moreover, although the inside of a case 7 is the reflector in which ultraviolet rays are reflected with this operation gestalt, the inside of a case 7 can also be made the configuration which is not made into a reflector. However, since the use effectiveness of the ultraviolet rays which the irradiated fluid tubing 5 could be made to turn and reflect the ultraviolet rays which have passed on the outside of the cylinder which consists of irradiated fluid tubing 5 rolled spirally, and were emitted from the

ultraviolet ray lamp can be improved, it is desirable for the inside of a case 7 to consider as the reflector in which ultraviolet rays are reflected.
[0032]
Moreover, although considered as the configuration which has an aeration means by which a case 7 consists of the inlet section 17, the exhaust-port section 19, a fan 15, etc. with this operation gestalt, it can also be made the configuration which has not established such an aeration means. However, it is desirable to establish an aeration means by extent of the temperature rise in a case 7, the class of processed fluid, the purpose of using a black light, etc.
[0033]
Here, for the application of the comparatively small black light for final effluent sterilization of a septic tank used for a cup type potable water vending machine, i.e., the black light for the potable water sterilization of a dispenser, the black light for oral cavity wash water sterilization built into the chair of dentistry medical application, a single-family house, etc., for example, in order to avoid the temperature rise of the water which is a processed fluid, it is necessary to use the black light of an outside ** type. However, for these applications, since the miniaturization of equipment is called for, the black light of a ** type may be unable to be used outside the former.
[0034]
On the other hand, the black light 1 of this operation gestalt is a black light of the outside ** type which can control the temperature rise of an irradiated fluid and can be miniaturized. for this reason -- for example, it is suitable for the application which it is necessary to suppress the temperature rise of an irradiated fluid called the black light for final effluent sterilization of the comparatively small septic tank used for a cup type potable water vending machine, i.e., the black light for the potable water sterilization of a dispenser, the black light for oral cavity wash water sterilization built into the chair of dentistry medical application, a single-family house, etc. and, and is asked for a miniaturization.
[0035]
The example which used hereafter the black light which comes to apply this invention to such an application is explained with reference to drawing 5 thru/or drawing 7 R> 7. Drawing 5 is the block diagram showing the outline configuration and actuation of an example of a dispenser equipped with the black light which comes to apply this invention. Drawing 6 is the block diagram showing the outline configuration and actuation of another example of a dispenser equipped with the black light which comes to apply this invention. Drawing 7 is the sectional view showing the outline configuration and actuation of an example of a septic tank equipped with the black light which comes to apply this invention.
[0036]
As shown in drawing 5 , it consists of cross valves 35 connected with the flush tank 29 which holds raw water, the pump 31 for liquid sending, the condensator 33, the black light 1 of this operation gestalt, and the tap 34, the cup type potable water vending machine, i.e., the dispenser, which supplies cooled potable water using the black light which comes to apply this invention. In this dispenser, the flow direction of water is switched to a tap 34 and the circulating flow way 37 by switching a cross valve 35. To the flow direction of water, in the circulating flow way 37, a flush tank 29, the pump 31 for liquid sending, the condensator 33, the black light 1, and the cross valve 35 are formed from the upstream, and water is returned to a flush tank 29 from a cross valve 35 on it.
[0037]

In such this dispenser, when not supplying cooled potable water, water circulates through the circulating flow way 37, and ultraviolet disinfection of water is performed by the black light 1 in this case. It will become impossible to supply cold water depending on about [that the loads of a condensator 33 increase in number] and the case, if the temperature of water rises by passing a black light at this time. However, in this dispenser, since it has the black light 1 of this operation gestalt, when water circulates through the circulating flow way 37, even if it passes a black light, the temperature of water cannot rise easily. Furthermore, since it can miniaturize, a black light 1 can also miniaturize the magnitude of the dispenser itself, and can offer the dispenser which reduced the installation tooth space by using a black light 1.

[0038]

As shown in drawing 6 , it consists of feed valves 43 connected with the water supply passage 39 directly connected with the water pipe etc. from the upstream to the flow direction of water at the activated-charcoal-absorption cylinder 41, the black light 1 of this operation gestalt, and the tap 34, another cup type potable water vending machine, i.e., dispenser, using the black light which comes to apply this invention. In this dispenser, potable water by which water carried out conduction to the water supply passage 39, and purification processing was carried out with the activated-charcoal-absorption cylinder 41 and the black light 1 is supplied from a tap 34 by opening a feed valve 43.

[0039]

A feed valve 43 is closed and water piles up in the activated-charcoal-absorption cylinder 41 and a black light 1 in the water supply passage 39 in the condition of not supplying potable water, in such this dispenser. Therefore, when water piles up in the black light which the ultraviolet ray lamp has always turned on, the temperature of water will rise. The rise of the temperature of the water without a black light which comes out causes the fault of shortening the life of an ultraviolet ray lamp. However, since it has the black light 1 of this operation gestalt, while water is piling up in a black light 1 in this dispenser, the temperature of water rises, and it is a difficulty pile.

[0040]

As the septic tank 45 using the black light which comes to apply this invention is shown in drawing 7 , the interior is divided into the impurity removal tub 49, the flow control tub 51, and the aerator 53 from the upstream to the flow of water by dashboards 46 and 47. Processed water flows into the impurity removal tub 49 from the input section 55, and turns to a pars basilaris ossis occipitalis the inside of the passage which constitutes the impurity removal tub 49 from the upper part, and flows from a pars basilaris ossis occipitalis to the upper part, and impurity is removed by the filtering medium 57 installed in passage. The processed water which passed the impurity removal tub 49 carries out overflow of the upper limit section of the dashboard 46 used as a weir, and flows into the flow control tub 51. The processed water which flowed into the flow control tub 51 flows into an aerator 53 from the flow control tub 51 through an airlift 59. The airlift 59 consists of airpipe way 59b in which it is inserted in at duct 59a and the same axle in duct 59a which has the part which it was made to extend in the vertical direction along with a dashboard 47, and was installed, and duct 59a, and the air from a blower carries out conduction.

[0041]

In the aerator 53, the dipping former flat film unit 61 is installed, where a film surface is stood in the direction of a vertical, the airpipe way 63 which supplies air is connected with the flat film lower part of the dipping former flat film unit 61, and the air diffuser 65 which turned the diffuser to the flat film of the upper part 61, i.e., a

dipping former flat film unit, is formed in it. The processed water in an aerator 53 carries out overflow of the upper limit section of the dashboard 47 used as a weir, and flows into the flow control tub 51. Moreover, an aerator 53 and the divided space are formed in the part in which the tap hole section 67 of the upper part of an aerator 53 was formed, and the black light 1 of this operation gestalt is installed in this aerator 53 and the divided space. The processed water in an aerator 53 is attracted in the lower part of a black light 1 through the siphon way 69, and the suction pump 71 sent to a black light 1 is formed in it. The processed water in the aerator 53 attracted with the suction pump 71 flows into the irradiated fluid tubing 5 from the input side connection section 9 of a black light 1 through the processed water supply line 73, and sterilization processing is carried out by the exposure of ultraviolet rays. The processed water by which sterilization processing was carried out flows into the processed water excurrent canal way 75 which connects the tap hole side connection section 11 and the tap hole section 67 of a black light 1 from the tap hole side connection section 11 of a black light 1, and flows out of the tap hole section 67 out of a septic tank 45.

[0042]

By such this septic tank 45, temperature of the processed water which flows out of a septic tank 45 cannot rise easily. Furthermore, since it can miniaturize, a black light 1 can also miniaturize the magnitude of septic tank 45 the very thing, and can offer the comparatively small septic tanks for [which reduced the installation tooth space] single houses by using a black light 1.

[0043]

[Effect of the Invention]

According to this invention, equipment can be miniaturized, improving the use effectiveness of the ultraviolet rays emitted from the ultraviolet ray lamp.

[Brief Description of the Drawings]

[Drawing 1] It is the sectional view seen from the side-face side which shows the outline configuration and actuation of 1 operation gestalt of a black light which come to apply this invention.

[Drawing 2] It is the top view showing the outline configuration and actuation of 1 operation gestalt of a black light which come to apply this invention.

[Drawing 3] It is the cross-sectional view of the black light explaining the condition of reflection of ultraviolet rays with irradiated fluid tubing.

[Drawing 4] It is expanding and showing [some of ultraviolet ray lamps explaining the condition of reflection of ultraviolet rays with irradiated fluid tubing and irradiated fluid tubing] drawing of longitudinal section.

[Drawing 5] It is the block diagram showing the outline configuration and actuation of an example of a dispenser equipped with the black light which comes to apply this invention.

[Drawing 6] It is the block diagram showing the outline configuration and actuation of another example of a dispenser equipped with the black light which comes to apply this invention.

[Drawing 7] It is the sectional view showing the outline configuration and actuation of an example of a septic tank equipped with the black light which comes to apply this invention.

[Description of Notations]

1 Black Light

3 Ultraviolet Ray Lamp

5 Irradiated Fluid Tubing

7 Case
15 Fan
17 Inlet Section
19 Exhaust-Port Section
23 27 Reflecting plate